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EXAMINER

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 14-16, 18-21, and 24-25 have been considered but are moot in view of the new ground(s) of rejection.
2. In response to applicant's argument (page 10, 2nd paragraph) that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., analyzing the control signals within the... MPEG stream... determining...to store in the DRAM or controlling... in the transport stream) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).
3. In response to applicant argument (page 10, 2nd paragraph) that in the Cheney reference "there is no discussion of any secondary set of memory control signals being employed that are generated from the compressed transport streams control signals" applicant should note that the claimed "generating a secondary set of control signals from the compressed transport stream's control signals" is met by the video decode system of Figure 6 and is further described in col. 9, line 9 – col. 13, line 36, where an MPEG input source signal is received at the memory control unit 652 and numerous control signals, which include at least the claimed "secondary set of control signals", are generated from the compressed transport stream or MPEG input source and memory

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control unit, and wherein “storing at least a portion of the compressed transport stream data signals via a first bus in a memory buffer controlled by the secondary set of control signals” is met by Fig. 2 and is further described in Col. 5, lines 52-62 of the Cheney reference, where data is stored in via a bus in the FIFO buffer.

4. In response to applicant argument (page 11, 1st paragraph) that in the So reference “there is no mention of any memory control signals ...to store data... stream in memory” applicant should note that So teaches that multiple transport streams may be received through the 1394 port and/or TV tuner 130, that the video graphics adapter stores a portion of the compressed transport stream data signals in the frame buffer memory controlled by a secondary set of control signals from the compressed transport stream control signals and stores uncompressed data in the frame buffer memory in a different mode of operation (Col. 17, lines 1-15, Col. 130, line 15 to Col. 131, line 30).

5. In response to applicant's argument (page 11) that the motivation for claim 21 is not relevant to applicants' invention, the examiner respectfully disagrees, the examiner beliefs that the advantage of providing a storage format which provides improved or optimum performance for storing a reference frame of pixel data on a scan line basis and the advantage of providing a storage format which allows for improved priority accessing of transport stream packets of video images to be displayed are relevant.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 14-16 and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheney et al., US 6,519,283 in view of So, US 5,909,559.

As to claim 14, note the Cheney et al reference which discloses a method of receiving video graphics data. The claimed "receiving a compressed transport stream associated with a digital video broadcast signal" is met by the digital video from cable or satellite broadcast signal 101 (Fig. 4) received at NIM 102, where a MPEG transport stream is sent to transport logic (XPORT) 103 (see col. 6, line 35-45). The MPEG transport stream is a compressed transport stream. In addition, the claimed "compressed transport stream having data signals and control signals" is inherent to a MPEG transport stream. The Applicants also disclose this in the "Background of the Invention" (or prior art) section of the specification, which describes the Digital Video Broadcast (DVB) transmission standards and specifically states that, "The compressed MPEG 2 format is referred to as a transport stream. The transport stream from the demodulator comprises a plurality of packets. Each of the transport stream packets comprises one synchronization byte, followed by one of 187 data bytes or 187 data bytes plus 16 extra bytes depending on the format." (See Specification, page 1, lines 15-19), in addition to, it is well known in the art that MPEG transport streams may

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comprise header information with routing information. Therefore, it is well known in the art that a MPEG transport stream comprises data signals as met by the data bytes, and control signals as met by the synchronization bytes and header information. The claimed “generating a secondary set of memory control signals from the compressed transport stream’s control signals” is met by the video decode system of Figure 6 and is further described in col. 9, line 9 – col. 13, line 36, where an MPEG input source signal is received at the memory control unit 652 and numerous control signals, which include at least the claimed “secondary set of memory control signals”, are generated from the compressed transport stream or MPEG input source and memory control unit, and wherein “storing at least a portion of the compressed transport stream data signals via a first bus in a memory buffer controlled by the secondary set of memory control signals” is met by Fig. 2 and is further described in Col. 5, lines 52-62 of the Cheney reference, where data is stored in via a bus in the FIFO buffer. In addition to, the claimed “wherein the memory buffer comprises a frame buffer that stores uncompressed data in a different mode of operation” is met by the frame buffer as described above, which stores both compressed and uncompressed data in different modes of operation, including both normal and scaled modes of operation (see col. 9, line 9 – col. 13, line 36). In one example, Cheney teaches that the MPEG input source is fed through the memory control unit 652 as coded MPEG 2 video data to the input of video decoder 654 and from the Huffman decoder 672 a B picture “MPEG-2 repeat field” signal is sent to display mode switch logic 696 (which also receives a vertical synchronization (VSYNC) signal that is an external synchronization signal) and frame

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buffer pointer control 686, and from the decoded signals from the MPEG transport stream's control signals, along with other signals, the frame buffer pointer control 686 generates additional control signals (see col. 9, line 31 – col. 12, line 63). More specifically, as described above, a B picture “MPEG-2 repeat field” signal from Huffman decoder 672 of video decoder 654 may be used in part by frame buffer pointer control 686 in Fig. 6 (col. 11, line 5 – col. 12, line 63). The claimed “storing at least a portion of the compressed transport stream data signals via a first bus in a memory buffer controlled by the secondary set of memory control signals” is also met by the frame buffer pointer control 686, in one mode, controlling the rotation of the frame buffers as described above (also see col. 10, lines 37-41 and col. 11, line 5 – col. 12, line 63), and the claimed “wherein the memory buffer comprises a frame buffer that stores uncompressed data in a different mode of operation”, is also met by Cheney where “I pictures” or I frames may be stored in the same memory buffers in both normal and scaled modes of operation (see col. 9, line 9 – col. 13, line 36). Although the Cheney reference discloses a PCI bus 42 (Fig. 2), the Cheney reference does not explicitly disclose the claimed sending the contents of the memory buffer via the first bus to a system bus. The So reference discloses improved integrated circuits and computer system embodiments for desktop and computers, television sets, set-top boxes and appliances improved with asymmetrical multiprocessors (see col. 129, lines 22-37). More specifically, the So reference teaches the use of a multimedia system with multiple buses, including a PCI bus or bus 124 in Fig. 1 (330 in later Figs.), as well as the claimed, “sending the at least a portion of the compressed transport stream data stored

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in the memory buffer via a first bus to a system bus” as met by the embedded frame buffer 128 sending the contents of the memory buffer via the AGP bus to the AGP port of the north bridge chip 108, where the contents may be sent to the PCI or system bus 124/330 through the PCI port (see Figs. 1 and 126-127 and col. 129, line 23 – col. 131, line 30). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have combined the method of receiving video graphics data as disclosed by the Cheney et al reference with the teachings the So reference which discloses using a north bridge integrated interface for multiple buses in conjunction with the frame buffer memory and a system or PCI bus for the advantage of having the ability to receive various types of broadcasts or multimedia streams through a computer system with a video graphics adapter or graphics engine and bus type system. One of ordinary skill in the art would have been led to make such a modification since television/multimedia receivers used with computers are well known in the art to provide additional capabilities within a computer system.

As to claim 15, the Cheney reference discloses multiple modes of operation and a method of receiving a digital video signal that is of a different type than the compressed transport stream, which is met by the video signals received at 104 in Fig. 4 (col. 4, lines 40-42 & 54-57 and col. 6, lines 62-67). The Cheney reference discloses a first mode of operation as shown by receiving a digital video signal 101, which includes a compressed MPEG transport stream (col. 6, lines 37-44). The Cheney reference also discloses another mode of operation wherein the digital video signal is of

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a different type than the compressed transport stream, which is met by the uncompressed digital video signals received at 104 in Fig. 4 (col. 4, lines 40-42 & 54-57 and col. 6, lines 62-67), which includes data signals including pixel data signals and control signals which are met by the corresponding synchronization signals (col. 4, lines 56-57), and by “pixel select control” signals (col. 7, lines 40-41). The digital multi-standard decoder (DMSD) 105 provides synchronization signals, such as, horizontal sync and vertical sync and the DMSD 105 provides the synchronization signals to the video decoder 106 which interprets the synchronization information and processes the data (col. 7, lines 7-18) to provide a secondary set of control signals through the use of the frame buffer pointer control 686 and other circuitry as shown in the video decode system of Fig. 6 and as previously described above in claim 14.

As to claim 16, the Cheney reference as combined above, further discloses a camcorder or television camera may be used as an uncompressed signal and connected video cameras may inherently comprise the transmission of a zoom video signal (see col. 8, lines 24-25 and ZV port definition from the Microsoft Computer Dictionary, p. 586).

As to claim 24, the Cheney et al reference teaches the claimed limitations of claim 24 as described in col. 9, line 9 – col. 13, line 36 and in USPN 5,668,599 by Cheney et al., entitled “Memory Management for an MPEG-2 Compliant Decoder,” the entirety of which is incorporated by reference (see col. 12, lines 38-42 of USPN

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6,519,283). More specifically, as previously stated above for claim 14, Cheney explicitly teaches the use of various types of control signals and/or synchronization signals as described in col. 9, line 9 – col. 13, line 36. Furthermore, the *Newton's Telecom Dictionary* specifically states in the definition of the term “packet” on page 546 that, “...A packet consists of the data to be transmitted and certain control information. The three principal elements of a packet include: 1. Header – control information such as synchronizing bits, address of the destination or target device, address of originating device, length of packet, etc. 2. Text or payload – the data to be transmitted... 3. Trailer – end of packet, and error detection and correction bits...” Therefore, the Cheney reference(s) clearly indicate(s) that the secondary set of control signals from the compressed transport stream's control signals indicates at least a first byte of a transport stream packet to be stored in the frame buffer, a first byte of the transport stream packet and a last byte of the transport steam packet, which are required in order to process the transport stream packets/frames and store the packets/frames in a frame buffer memory.

As to claim 25, the claim is rejected based on the rejection of claims 14 and 24.

8. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schindler et al., US 5,900,867 in view of So.

As to claim 18, the Schindler et al reference discloses a system for receiving a digital video broadcast signal. The claimed "tuner to receive a digital broadcast signal and to provide an analog output signal" is met by tuner 410 in Fig. 4, which receives a

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digital signal (MPEG or MPEG-2) that is transmitted on an analog carrier signal (see col. 10, lines 31-40). The claimed "demodulator coupled to... the tuner, and to provide a transport stream" is met by digital demodulator 412, which demodulates the tuned signal and provides the compressed digital MPEG transport stream signals (col. 10, lines 37-44 and 51-56). The claimed "video graphics adapter..." is met in part by the video graphics adapter (VGA) 318, as shown in Fig. 5, where the controller 510 or tuner 526 and/or decoder 530 send the MPEG encoded video stream to the MPEG-2 decoder 512 (col. 11, line 34 - col. 12, line 18). The claimed "video graphics adapter further includes a bus interface port coupleable to a central processing unit" is met by the PCI bus interface port from controller 510 in VGA card 318 (see Fig. 5 and col. 11, lines 35-38), which is coupleable to processor 310 via the PCI Bus (see Fig. 3 and col. 9, lines 17-24). The claimed VGA further includes an engine, or graphics engine is met by the MPEG-2 decoder 512 in Fig. 5 (see col. 11, lines 37-44), and the claimed video output port is met by either the audio video output connector 542 (see col. 11, lines 61-63 and col. 12, lines 3-6), or the video output 522 as shown in Fig. 5 (see col. 11, lines 40-55, more specifically lines 52-55). The Schindler et al reference teaches that the digital video broadcast signal as described above is transmitted through the PCI bus 312. Schindler also teaches that the VGA 318 as shown in Fig. 5 may also directly receive broadcast signals through audio and video inputs 524, 544, 546 and 548 (col. 11, lines 56-66), more specifically, standard cable connector 524, which may receive broadcasts, is coupled to tuner circuit 526 (col. 11, lines 56-60). Although the Schindler et al reference does not explicitly disclose that the video broadcast received through

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connector 524 is a digital video broadcast, and more specifically the claimed, "transport stream port to receive the compressed transport stream and another transport stream" and the "video graphics adapter stores a portion of the compressed transport stream data signals in the frame buffer memory controlled by a secondary set of memory control signals from the compressed transport stream control signals and stores uncompressed data in the frame buffer memory in a different mode of operation", the So reference teaches improved integrated circuits and computer system embodiments for desktop and computers, television sets, set-top boxes and appliances improved with asymmetrical multiprocessors (see col. 129, lines 22-37). More specifically, the So reference teaches the use of a multimedia system with multiple buses, including a PCI bus or bus 124 in Fig. 1 (330 in later Figs.), as well as the claimed, "transport stream port to receive the compressed transport stream and another transport stream" as met by the north bridge chip 108, which has multiple ports and a PCI or system bus connection through the PCI port to the PCI/system bus 124/330 (see Figs. 1 and 126-127 and col. 129, line 23 - col. 131, line 30). Multiple transport streams may be received through the 1394 port and/or TV tuner 130. The video graphics adapter stores a portion of the compressed transport stream data signals in the frame buffer memory controlled by a secondary set of memory control signals derived from the compressed transport stream control signals and stores uncompressed data in the frame buffer memory in a different mode of operation (Col. 17, lines 1-15, Col. 130, line 15 to Col. 131, line 30). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have combined the method of receiving video graphics data as disclosed by

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the Schindler et al reference with the teachings the So reference which discloses using a north bridge integrated interface for multiple buses in conjunction with the frame buffer memory and a system or PCI bus for the advantage of having the ability to receive various types of broadcasts or multimedia streams through a computer system with a video graphics adapter or graphics engine and bus type system, in addition to providing the advantages of reducing hardware components, simplifying the system and bypassing the PCI bus, which would cut manufacturing costs and improve processing speed as shown by the So reference. One of ordinary skill in the art would have been led to make such a modification since television/multimedia receivers used with computers are well known in the art to provide additional capabilities within a computer system and combining the components in to a single system before connecting to the PCI bus as shown by the So reference would provide a more efficient system.

As to claim 19, the Schindler reference discloses a memory to store at least a portion of the compressed transport stream as met by DRAM 514 in Fig. 5 (see col. 11, lines 37-47). More specifically, the So reference as combined above with Schindler further teaches an internal memory 128 or frame buffer memory (DRAM) coupled to the graphics engine 126, the transport stream port (116 of DSP1), and the system bus interface port (PCI 122) to store at least a portion of the transport stream..., as previously described above in claim 14.

As to claim 20, the Schindler reference discloses the claimed central processor unit coupled to the bus interface port of the video graphics adapter as met by processor 310 (see Fig. 3 and col. 9, lines 17-24), which is coupled to the bus interface port (controller 510) of the VGA 318 via the PCI BUS 312 (see Fig. 5 and col. 11, lines 35-38). The claimed transport demultiplexer coupled to the demodulator is met by the demultiplexer 416, which is coupled to the demodulator 412 through the F.E.C. 414 as shown in Fig. 4 (see col. 10, lines 40-58).

9. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schindler in view of Malladi et al., US 5,912,676 and further in view of Datari US 6,418,169.

As to claim 21, note the Schindler et al reference which discloses a method of storing video data. Schindler et al discloses multiple modes of operation, such as receiving a digital video broadcast signal (MPEG/compressed) from a satellite dish as shown in Fig. 4, or receiving a standard cable broadcast signal at 524 as shown in Fig. 5. The claimed first mode of operation comprising storing pixel information in a frame buffer of a video adapter, wherein one line of frame buffer memory is representative of one line of a video image to be displayed is met in part by receiving an uncompressed signal from a cable video source through connector 524 (Fig. 5), as described above, where the video signal may be buffered in VRAM 518 for output to a monitor (see col. 11, line 34 - col. 12, line 3). Although, Schindler does not explicitly disclose that one line Of the frame buffer memory is representative of a line of video image to be displayed, it

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is well known in the art of uncompressed video frame buffers that a line of frame buffer memory may be *representative* of a line of a video image to be displayed. The Malladi et al reference teaches that various frame storage formats exist for storing frame data in memory, and that one method for storing a frame of pixel data is on a scan line basis, where the data is stored in memory scan line by scan line for pictures or frames that are to be displayed (see col. 4, lines 30-37). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the method of the Schindler et al reference which , discloses multiple modes of operation and storing video data, with the Malladi et al reference, which specifically teaches that one line of frame buffer memory may be representative of one line of a video image to be displayed for the advantage of providing a storage format which provides improved or optimum performance for storing a reference frame of pixel data on a scan line basis. The claimed second mode of operation comprising storing compressed transport stream data in the frame buffer, wherein one line of frame buffer memory is representative of one transport stream packet is met in part by the Schindler et al reference, which also discloses receiving an MPEG transport stream from a digital video source Fig 4, as described above, where the compressed MPEG transport stream is sent to the PCI bus 312, where the video graphics adapter card receives the MPEG stream through controller 510 (Fig. 5, col. 11, lines 34-37), and the MPEG data is routed to MPEG-2 decoder 512 with associated random access memory (DRAM 514), which is Used as buffer in assisting with the decoding (see col. 11, lines 37-47) and in lines 34-52 (specifically lines 49-52), the MPEG data (compressed video) may be provided back to

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controller 510, which then places the video information into dynamic random access memory (DRAM) or video random access memory (VRAM) 518 as used by the other video signal described above. The VRAM 518 is a frame buffer which buffers the video before it is transmitted for display. Although, the Schindler et al reference does not explicitly disclose that one line of the frame buffer memory is representative of one transport stream packet, it is well known in the art of video transport streams that are stored in frame buffers that a MPEG-2 transport stream packet has a fixed 188 byte length as defined by MPEG standards, and therefore, a line of frame buffer memory is *representative* of a transport stream packet since every MPEG-2 transport stream packet has already been produced and transmitted according to the established MPEG standards so that when received by a frame buffer memory a line of memory is representative of one transport stream packet. In addition to, the Datari reference teaches that MPEG video data packets may be stored or buffered in memory and sequentially accessed by priority (see col. 5, lines 13-42 and col. 6, lines 62-66, also see col. 8, lines 10-18). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further combined the method of Schindler et al which discloses multiple modes of operation and storing video data, with the Datari reference, which specifically teaches that a line of the frame buffer memory may be representative of one MPEG or transport stream packet for the advantage of providing a storage format which allows for improved priority accessing of transport stream packets of video images to be displayed.

Allowable Subject Matter

10. Claims 2-13 and 22-23 are allowed.

The following is an examiner's statement of reasons for allowance:

As to independent claim 22, the prior art, alone or in combination, does not teach or fairly suggest a video graphics system comprising all of the claimed subject matter in its entirety including a data storage controller having at least one pair of a plurality of internal control ports to communicate control signals within the data storage controller.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Oschta Montoya whose telephone number is (571)270-1192. The examiner can normally be reached on Monday/Friday 8:00 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John W. Miller can be reached on (571) 272-7353. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John W. Miller/
Supervisory Patent Examiner, Art Unit 2421

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